The water is dammed up, and a sloping channel left; at the bottom a cloth is spread, kept down by stones so as to make the bottom uneven; one man sprinkles the auriferous earth over the channel, and another flushes the channel by means of a leather bag, the pieces of gold fall into the inequalities and are easily collected in the cloth by lifting up the stones. The yield is large, nuggets of two pounds weight are found; the gold sells on the spot at rather less than thirty rupees per ounce. A gold commissioner or "sarpon" superintends all the goldfields, a string of which extends along the northern watershed of the Brahmaputra, from Lhasa to Rudok. Each field has a chief or master, but anyone may dig who pays the annual licence-fee of one sarapoo or two-fifths of an ounce.

The curious posture for sleeping, universal among the Thibetans, was observed here. They invariably draw their knees close up to their heads, and rest on their knees and elbows, huddling every scrap of clothing they can muster on their backs; the richer rest thus on a mattress rising towards the head. The poorer avail themselves of a suitable slope on the hill side, or pile stones and earth to a convenient height. This position is most probably adopted in order to secure as much warmth as possible for the abdomen, the thighs pressing against it and excluding the air.

The gold-diggers recreate themselves with tobacco smoked in iron pipes, and, notwithstanding the hardships of their laborious toil, seem very merry, singing songs in chorus, in which the women and children join.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his Correspondents.*]

Lectures to Ladies

YOUR correspondent "M." in her letter, which appeared in NATURE No. IV., on the subject of the exclusion of teachers from the lectures to ladies at South Kensington and University College, is scarcely just in her remark that "at University College they don't pretend to care for such an audience." The committee of the Educational Association certainly do not *pretend* to care for governesses, but give a more substantial proof of their care by admitting them on reduced terms.

All honour to "M." for advocating the claims of governesses; but has she not, in her desire for improving their mental faculties, omitted to take an account of their physical powers? To the question, therefore, which she has propounded—"How can any one who is hard at work all day go to a lecture in the forenoon?"—I am tempted to reply, in the American fashion, by asking another: "How can any one who is *hard* at work all day go to a lecture in the evening?" There is also the minor consideration that the hire of a lecture-room (the majority of our classes being held in a hired room) for the evening is nearly twice that of a room for the morning, so that it would be a somewhat hazardous experiment to institute evening classes on the chance of ladies who are engaged in teaching all day attending in sufficient numbers to pay the rent.

In conclusion, I hope that if "M." can spare a few minutes of her valuable time some forenoon, she will look in at one of our lectures; and if she sees, or rather hears, anyone answering the description of "Lady Barbara, who sneers aloud," I will use my utmost endeavours to get up an evening class for "M." even though she should be the only pupil.

THE HON. SEC. OF THE LADIES' EDUCATIONAL ASSOCIATION, LONDON

Chrysophanus Dispar

YOU ask for information about *Chrysophanus Dispar*. The statement that it has been met with in Kerry is not in itself improbable, and entomologists will be interested in having it confirmed; but when we find it said in the same paragraph that the insect is not uncommon in England, it will be received with doubt. *C. Dispar* has hitherto been found in only one locality in these islands, the neighbourhood of the fens formerly surrounding Whittlesea Mere. Other localities appear in works on entomology, but have never been authenticated. Owing partly to the drainage of the fens, and partly to the indefatigable efforts of dealers and other collectors, the insect has been quite extinct, I believe, for nearly twenty years.

Of late years the subdivision of species in entomology as well as in other departments of Natural History has been somewhat checked. What formerly appeared as those distinct species of *Polyommatus*, in our books of British Butterflies, under the names of Agestis, Artaxerxes, and Salmacis, are now all referred to the first-named species. Agestis is absent where Salmacis is found, and both where Artaxerxes is found, and the variety is referred to the difference of latitude. In the same way entomologists no longer recognise any specific distinction between *C. Dispar* and *C. Hippothoe*, widely-spread continental species. I possess a fine series of *C. Dispar* reared from larvæ taken in the year 1846. The spot in which they were found is close to the Holme station, 69 miles from London on the Great Northern Railway. They fed exclusively on the common water dock (*Rumex Palustris*). It is a curious illustration of the obscure causes which regulate the geographical range of species, that though the plant is abundant in the whole range of fen country, and generally throughout England, the butterfly was always confined to that immediate neighbourhood.

C. Virgaureæ was introduced into catalogues of British Lepidoptera on the authority of dealers, but its claims to be a British species were never authenticated.

Eton, Windsor. C. W. D.

The Brighton Aquarium

WOULD it be unduly troubling you were I to ask you to inform me, through the medium of the columns of NATURE, if the much-talked-of Brighton Aquarium is really to be "started"?

H. H. MOTT

The Cloaca Maxima

WILL you pardon me for asking a question which probably I ought to be able to answer myself? Mr. Corfield, in his interesting comparison of the hygienic performances of the ancients and ourselves, mentions the well-known Cloaca Maxima as one of the great glories of the Romans. Can he tell us how they got the sewage into it? I presume the invention of Bramah was not known in those times, and I was a little disappointed in not finding in his able paper a solution of a mystery which has puzzled me since my childhood. What did the Romans want with a Cloaca Maxima, and how did they use it?

Dec. 11th. IGNORAMUS

Lightning in a Clear Sky

THE following extract from the "Life of Charlemagne," by Eginhard, a contemporary, may be interesting to C. W. D. "Cum Carolus imperator ultimam in Saxoniam expeditionem contra Godefridum, regem Danorum, ageret, quadam die, cum, ante exortum solis, castris egressus, iter agere cœpisset, vidit repente delapsam cœlitus cum ingenti lumine facem a dextra in sinistram per serenum aera transcurrere; cunctisque hoc signum, quid portenderet, admirantibus, subito equus quem sedebat, capite deorsum merso, decidit, eumque tam graviter ad terram clisit, ut fibula sagi rupta balteoque gladii dissipato, a festinantibus qui aderant ministris exarmatus non sine adminiculo levaretur. Jaculum etiam quod tunc forte manu tenebat, ita elapsum est ut viginti vel eo amplius pedum spatio longe jaceret."

J. M. W.

NOTES

IT is stated that the Council of the British Association for the Advancement of Science have determined to ask the permission of the Lord President of the Council to appear before him as a Deputation, to urge upon the Government the need of a Royal Commission to inquire into the Present State of Science in England. We may congratulate ourselves that in Lord De Grey we have a Minister whose well-known large and scientific sympathies ensure a careful consideration of the important proposition to be laid before him.

MOST of our readers know ere this that the Government has determined not to fill up the appointment of the Mastership of the Mint vacant by the death of the lamented Graham. The duties are to be performed by Mr. Freemantle, who deserves all praise for what he has done; and the Mint is, for the future, to be looked upon as an outpost of the Treasury. One hoped, seeing how rare are the scientific rewards in England, that a post that had been held by a Newton, a Herschel, and a Graham, might have been left as it was; but we hear that the Government have, in this case, some real justification for what they have done. In fact, it is the tendency shown by this action—a tendency to cut down everything, especially everything scientific—and not the action itself, which is more in question.

THERE is more and later news from Livingstone, who, judging from his letter to Dr. Kirk, published in the journals, is still weak in health. All we need give is his own idea of the work he has yet to accomplish:—"As to the work to be done by me, it is only to connect the sources which I have discovered from 500 to 700 miles south of Speke and Baker's with their Nile. The volume of water which flows north from latitude 12° south is so large, I suspect I have been working at the sources of the Congo as well as those of the Nile. I have to go down the eastern line of drainage to Baker's turning point. Tanganyika, Nyige Chowambe (Baker's?) are one water, and the head of it is 300 miles south of this. The western and central lines of drainage converge into an unvisited lake west or southwest of this. The outflow of this, whether to Congo or Nile, I have to ascertain. The people of this, called Manyema, are cannibals, if Arabs speak truly. I may have to go there first, and down Tanganyika, if I come out uneaten, and find my new squad from Zanzibar."

WE take a remarkable instance of resolute self-sacrifice from Mr. Hayward's account of the Turki rebellion against the Chinese dominion in 1863:—The Chinese garrison was shut up in the fort of Yarkand, and for 40 days besieged by the Turki army: the only terms offered were that all should embrace Islam. The old Amban—the Chinese Viceroy of Turkestan—summoned his officers to a council, held in an upper room, the lower room was piled with barrels of gunpowder, with a train leading from beneath the chair of state. The officers assembled, wrangling about the probable ransom that would be taken. The Amban's sons moved among them, offering tea and sweetmeats, his daughters knelt weeping by his side, he himself sat calmly smoking his long pipe. Suddenly cannon shots were heard, and the shouts of Allah Akhbar announced the advance of the enemy to storm. A hint of the Amban's resolution spread among the assembly, amidst the confusion he spoke a short farewell, and calmly turning his pipe-bowl, shed the embers on the train—and all was over.

WE learn that the account of Professor Jacobi's new process for the electro-deposit of iron, which has recently appeared in this country, does not include several improvements of great scientific interest which have recently been developed, an account of which we hope shortly to give.

THE following notice has been issued by desire of the Lord Chancellor:—"The electors to the Savilian Professorship—namely, the Archbishop of Canterbury, the Lord Chancellor of Great Britain, the Chancellor of the University of Oxford, the Lord Bishop of London, the Secretary of State for the Home Department, the Lord Chief Justices of the Queen's Bench and Common Pleas, the Lord Chief Baron of the Exchequer, the Dean of the Arches, and the Warden of New College (who may, if it be their pleasure, call into council the Vice-Chancellor of the University of Oxford)—will proceed to the election of a Savilian Professor on Thursday, the 10th day of February, 1870, or as soon thereafter as may be. All candidates are required to be of the full age of 26 years, and, if Englishmen, to be Masters of Arts at the least. The other regulations respecting the Savilian Professor may be seen in the University Statute sanctioned by Her Majesty the Queen in the year 1858. Candidates are to send their applications, addressed to Gordon Whitbread, Esq., 31, Great George Street, Westminster, S.W., on or before the 24th of January, 1870."

Here is another note from Oxford:—The examiners for the Radcliffe Travelling Fellowship—Dr. Acland, Dr. Rolleston, and Sir B. C. Brodie—have given notice that the next examination for a Fellowship will commence on Monday, January 31, at 10 a.m. Candidates are requested to send their names on or before Wednesday, January 19, by letter addressed to the Regius Professor of Medicine, Museum, Oxford.

THE exploration of the caves at Wellington, in the western district of New South Wales, under the direction of Mr. Krefft and Dr. A. M. Thomson, is making good progress, and many remains of extinct animals, some of which are new to science, have been discovered. A trial shaft is already put down in the centre of the Breccia cave, to the depth of fifteen feet, and bones are still found at that depth.

As already stated in this journal, the University of Edinburgh has just made arrangements to enable ladies who wish to do so to study medicine. Those who avail themselves of the opportunity are taught in separate classes from those of the other medical students, each Professor at the University holding one class for men and another for women. Five lady students have already presented themselves for the medical matriculation examination. In London there is a "Female Medical Society," under the presidency of the Earl of Shaftesbury. The objects of the Female Medical Society are—"1. To promote the employment of properly educated women in the practice of midwifery, and the treatment of the diseases of women and children. 2. To provide educated women with proper facilities for learning the theory and practice of midwifery, and the necessary branches of medical science." To carry out these objects, the Society established a "Ladies' Medical College" five years ago, and eighty-two ladies have during that period availed themselves of the facilities it offered; most of them have since started in business, and are succeeding admirably.

DR. PETERMANN, of Gotha, the well-known German geographer, publishes an interesting article in the *Cologne Gazette* on the mission of Dr. Nachtigal to Central Africa. The latter was sent by the King of Prussia, on the 18th of February, 1869, to present Sultan Scheick Omar with some valuable gifts from King William, in recognition of the friendly reception given by the Sultan, in 1866, to Herr Gerhard Rohlfs and Herr Von Beuermann, an officer of the Prussian army. Dr. Nachtigal proceeded to Mursuk (near which place Miss Tinné was murdered), but finding that there was no prospect at present of reaching Bornu in safety, he proceeded on an expedition to Tibesti, in the Tibbu country, leaving the presents at Mursuk. Similar expeditions, says Dr. Petermann, have been undertaken by various eminent travellers during the last fifty years. In 1820 the Tibbu country was visited by Lyon; in 1822 by Denham, Clapperton, and Oudney; in 1853 by E. Vogel; in 1855 by Dr. Barth; in 1862 by Herr Von Beuermann; and in 1866 by Gerhard Rohlfs. Most of these attempted to go through Tibesti, but without success; and Dr. Nachtigal is the only European who has ever accomplished this dangerous feat. He left Mursuk on the 6th of June last, and returned on the 8th of October, after a series of wonderful adventures and escapes, which are related in a report addressed by him to Dr. Petermann, and now in the press.

THE Weekly Bulletin of the Scientific Association of France, dated the 12th instant, contains letters from Algeria recording a series of violent earthquake shocks experienced at Biskra, Seriana, and Sidi Okba, in the Province of Constantine. The disturbances extended from the 16th to the 19th of November, and appear to have been of a very alarming character. The fact that no great damage was done to buildings is ascribed to the movement being chiefly vertical. The horizontal direction is stated by an observer to be from south-west to north-east, and by another from north-east to south-west.

SCHOPENAUER'S treatise on the "Philosophy of vision and colours," which originally appeared upwards of fifty years ago, and which has hitherto been treated with unmerited neglect by the great writers on physiological optics, has just reached a third edition. An interleaved and annotated copy of the second edition prepared by the author himself in 1854 was found amongst his papers, and has formed the basis for the present "improved and augmented" reissue, which appears under the editorship of Julius Frauenstädt.

WE desire to call special attention to the singularly interesting address of the new Rector of the University of Vienna, Carl von Littrow, on a subject which does not at first sight appear to be of a very interesting character, viz., the backwardness of the ancients in the sciences. This backwardness he ascribes, firstly, to an actual want of the power of accurate observation; and, secondly, to a restless spirit of speculation. The illustrations of these positions are drawn from astronomy, the science to which in early times the greatest care was devoted. Of the instances adduced to show that the ancients, notwithstanding their fine feeling for form, evidenced in the remains of classic art, had not even the most primitive power of observation, we may mention the following. According to the elder Pliny, whose estimate is very much higher than those of Hipparchus and Ptolemy as recorded in the Almagest, the number of fixed stars is 1,600; whereas, in our own day, Argelander, working in such a comparatively unfavourable climate as Bonn, records on his maps no less than 3,256 stars visible to the naked eye. Again, Argelander gives nineteen as the number of nebulæ and star-clusters visible in our latitudes, while Hipparchus mentions only two, and Ptolemy but five; both of these observers entirely passing over such remarkable objects as the nebulæ in Orion and in Andromeda. The group of the Pleiades was considered of great importance for ancient navigation, and was constantly watched; and yet only seven of its stars were discovered. Indeed most of the early observers could only see six; the seventh was lost sight of for centuries; and ultimately, when the middle star in the tail of the Great Bear first attracted attention, the conclusion arrived at was that the latter was the missing seventh star of the Pleides. Nowadays cases are known of people who are not astronomers seeing from fourteen to sixteen stars in the Pleiades; and it is by no means uncommon for persons of good sight to see eleven. The star α in Capricornus was seen by man for thousands of years without its being noted that it is a double star, a fact that any child would discover now if its attention were directed to it. It would be interesting to know what is the capacity of individuals of savage races as regards discriminating celestial objects. Light might then be thrown upon the question, how far the observational defects of the early astronomers were due to mere carelessness, and how far we inherit a schooled eye from generations of ancestors who gradually accustomed themselves to the accurate discrimination of external objects.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 9.—Dr. W. A. Miller, V.P., in the chair. The following papers were read:—

"Spectroscopic Observations of the Sun."—No. V. By J. Norman Lockyer, F.R.S.

The author first referred to several new facts of importance as follows:

"I. The extreme rates of movement in the chromosphere observed up to the present time are—

Vertical movement	40 miles a second
Horizontal or cyclonic movement .	120 ,,

"II. I have carefully observed the chromosphere when spots have been near the limb. The spots have sometimes been accompanied by prominences, at other times they have not been so accompanied. Such observations show that we may have spots visible without prominences in the same region, and prominences without spots; but I do not say that a spot is not accompanied by a prominence *at some stage of its life*, or that it does not result from some action which, in the majority of cases, is accompanied by a prominence.

"III. At times, when a prominence is seen bright on the sun itself, the bright F line varies considerably, both in thickness and brilliancy, within the thickness of the dark line. The appearances presented are exactly as if we were looking at the prominences through a grating.

"IV. Bright prominences, when seen above spots on the disk, if built up of other substances besides hydrogen, are indicated by the bright lines of those substances in addition to the lines of hydrogen. The bright lines are then seen very thin, situated centrally (or nearly so) on the broad absorption-bands caused by the underlying less-luminous vapours of the same substances.

"V. I have at last detected an absorption-line corresponding to the orange line in the chromosphere. Father Secchi states[*] that there is a line corresponding to it much brighter than the rest of the spectrum. My observation would seem to indicate that he has observed a bright line less refrangible than the one in question, which bright line is at times excessively brilliant. It requires absolutely perfect atmospheric conditions to see it in the ordinary solar spectrum. It is best seen in a spot-spectrum when the spot is partially covered by a bright prominence.

"VI. In the neighbourhood of spots the F bright line is sometimes observed considerably widened out in several places, as if the spectroscope were analysing injections of hydrogen at great pressure in very limited regions into the chromosphere.

"VII. The brilliancy of the bright lines visible in the ordinary solar spectrum is extremely variable. One of them, at 1871·5, and another, at 1529·5 of Kirchhoff's scale, I have detected in the chromosphere at the same time that they were brilliant in the ordinary solar spectrum.

"VIII. Alterations of wave-length have been detected in the sodium-, magnesium-, and iron-lines in a spot-spectrum. In the case of the last substance, the lines in which the alteration was detected were *not* those observed when iron (if we accept them to be due to iron alone) is injected into the chromosphere.

"IX. When the chromosphere is observed with a tangential slit, the F bright line close to the sun's limb shows traces of absorption, which gradually diminish as the higher strata of the chromosphere are brought on to the slit, until the absorption-line finally thins out and entirely disappears. The lines of other substances thus observed do not show this absorption.

"X. During the most recent observations, I have been able to detect traces of magnesium and iron in nearly all solar latitudes in the chromosphere. If this be not merely the result of the good definition lately, it would indicate an increased general photospheric disturbance as the maximum sunspot period is approached. Moreover, I suspect that the chromosphere has lost somewhat of its height."

The author appends a list of the bright lines, the position of which in the chromosphere have been determined absolutely, with the dates of discovery, remarking that in the case of C and F his observations were anticipated by M. Janssen:—

Hydrogen

C. October 20, 1868.
F. October 20, 1868.
near D. October 20, 1868.*
[* *Hydrogen ?*—G. G. S.]
near G. December 22, 1868.
h. March 14, 1869.

Sodium

D. February 28, 1869.

Barium

1989·5[†] March 14, 1869.
2031·2 July 5, 1869.

Magnesium and included line

$\left.\begin{array}{l} b^1 \\ b^2 \\ b^3 \\ b^4 \end{array}\right\}$ February 21, 1869.

---

[*] *Comptes Rendus*, 1869, 1 sem. p. 358.

[†] This reference is to Kirchhoff's scale.